

*PSYCHROPOTES HYALINUS*, NEW SPECIES, A  
SWIMMING ELASIPOD SEA CUCUMBER  
(ECHINODERMATA: HOLOTHUROIDEA)  
FROM THE NORTH CENTRAL  
PACIFIC OCEAN

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*Abstract.*—*Psychropotes hyalinus*, new species, is described. The body is colorless and transparent, the dorsal appendage is situated approximately one-third of the body length from the posterior end of the body, the skin is more or less smooth, and contains two types of ossicles in the form of spinose crosses. The species is evidently capable of swimming, as the only known specimen was captured in a trap five meters above the seafloor.

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The deep-sea Order Elasipodida contains many holothurians that are capable of swimming for varying periods of time. Some species appear to be obligate swimmers, while others can swim for only short periods of time and short distances (Hansen 1975; Pawson 1976, 1982; Pawson and Foell, in press). Hansen (1975) and earlier authors have suggested that within the Family Psychropotidae some species are capable of swimming, and indeed *Psychropotes depressa* Theel was photographed in the act of swimming by Pawson (1976—reported as “*Euphronides* sp.”). Through the kindness of Drs. Ken Smith and Nancy O. Brown of the Scripps Institution of Oceanography, La Jolla, California, I was sent a specimen of *Psychropotes* which had been captured in a near-bottom trap deployed in abyssal depths in the Pacific Ocean north of Hawaii. The specimen represents a new species, and is described below. I am grateful to Drs. Smith and Brown for allowing me to study this specimen, and to John E. Miller, Harbor Branch Foundation, for reading the manuscript of this paper. The specimen is deposited in the National Museum of Natural History (USNM), Smithsonian Institution, Washington, D.C., U.S.A.

Order Elasipodida Theel  
Family Psychropotidae Theel, 1882  
*Psychropotes* Theel, 1882  
*Psychropotes hyalinus*, new species  
Fig. 1

*Diagnosis.*—Body transparent, colorless. Dorsal appendage situated approximately one-third of the body length from the posterior end of the body. Dorsal body-wall ossicles of two types, larger crosses with spinose arms and single spinose apophyses, and smaller crosses with spinose arms.

*Material examined.*—HOLOTYPE USNM E31731, RAMA 2, 2 May 1980 central North Pacific north of Hawaii, 30°05.7'N, 158°44.5'W, tent trap deployed 5 m above seafloor in depth of 5891 meters.

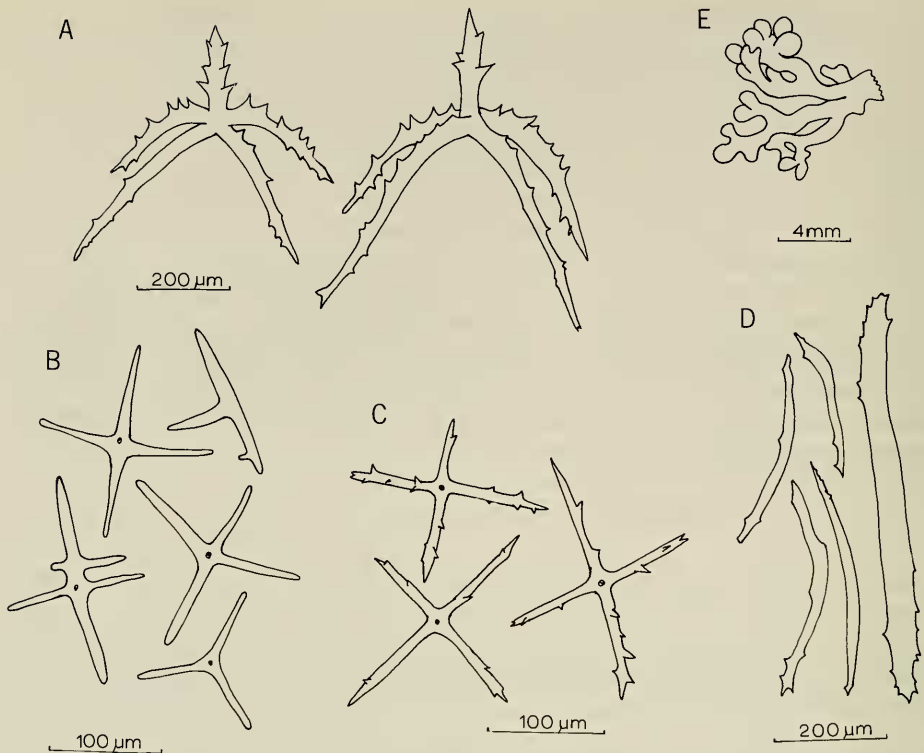


Fig. 1. *Psychropotes hyalina* new species. A, Large four-armed crosses from dorsal body wall; B, 3- and 4-armed crosses from wall of intestine; C, Small 4-armed crosses from dorsal body wall; D, Straight and curved rods from discs of tentacles; E, Portion of testis showing branching genital tubules.

*Description.*—Body of typical “*Psychropotes*-shape” (see Heezen and Hollister 1971, figs. 2.56, 2.57, 5.17), fragile, transparent, with light-reflective dermal layer of ossicles. Body approximately 160 mm long and 30 mm in diameter, more or less cylindrical, with flattened ventral surface. Conspicuous dorsal appendage approximately 70 mm long arising from middle of dorsum, 60 mm from posterior end of body. Flat subcircular brim overlying ventrally turned mouth and tentacles.

Tentacles 15, non-retractile, with elongate oval terminal discs approximately  $8 \times 6$  mm; long axis of tentacle disc radial in relation to mouth. Edges of discs scalloped, with approximately 25 short, rounded digitiform projections. Mouth circular, 4 mm in diameter, at center of unadorned oral field.

Pinkish to violet internal organs clearly visible through body wall. Holotype, male; testis consisting of conspicuous bunch of branching tubules (Fig. 1E) located at extreme anterior end of body cavity. Internal musculature not well developed. Intestine empty.

Ossicles in body wall numerous 4-armed crosses of 2 types. Large crosses (Fig. 1A) reaching maximum diameter of 1.0 mm, having 4 curved spinous arms, with spines having no regular arrangement; long unbranched central apophysis carrying prominent spines. Large crosses oriented in body wall with apophyses pointing outwards, forming small contiguous pustules on body wall. Spaces between large

crosses occupied by numerous small crosses (Fig. 1C) with slightly curved arms carrying weakly developed spines; central apophysis, when present, small; small crosses average 200  $\mu\text{m}$  in diameter. Dorsal appendage with numerous smaller crosses; larger crosses also present but far less numerous.

Intestine wall with 3- and 4-armed crosses (Fig. 1B), latter type most common. Arms of crosses more or less straight, with 1 or 2 weakly developed blunt spines; occasionally, short blunt apophysis present. Average diameter of these ossicles 150  $\mu\text{m}$ .

Tentacle discs contain straight or curved rods (Fig. 1D) with scattered spines or knobs. Rods greatly variable in length, maximum length approximately 650  $\mu\text{m}$ .

*Behavior.*—As this species was captured some 5 meters above the seafloor, it is apparently capable of actively swimming, but nothing else is known about its living habits. The intestine is completely empty, but it is likely that this animal feeds on the seafloor, perhaps in the same manner as *Eynypniastes* (Pawson, 1982).

*Remarks.*—The presence of a relatively smooth dorsal skin (rather than a skin with warts, each wart containing a giant cross-shaped ossicle), and the location and size of the dorsal appendage place this new species near *P. semperiana* Theel, 1882, and *P. minuta* Koehler and Vaney, 1905, in the key to *Psychropotes* provided by Hansen (1975). *Psychropotes hyalinus* differs from both species in color (they are dark violet) and in characters of the body wall ossicles. In *P. semperiana*, the smaller crosses have high central apophyses carrying downcurved hooks, while in *P. minuta*, the body wall crosses are of only one type, not two, as in *P. hyalinus*.

In having an essentially transparent to whitish body wall, *P. hyalinus* differs from almost all other species in the genus which usually tend to be violet or purple. According to Hansen (1975) only *P. loveni* Theel is whitish when it is small (20–25 mm long) but apparently this species becomes violet as it grows (Theel 1882). In addition, the dorsal appendage of *P. loveni* is very close to the posterior end of the body, in contrast to the situation in *P. hyalinus*.

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